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**A5R RCL**

(56) Documents cited  
**GB 2170705 A GB 0372628 A EP 0462027 A1**  
**EP 0203437 A2 US 4939345 A US 4890395 A**  
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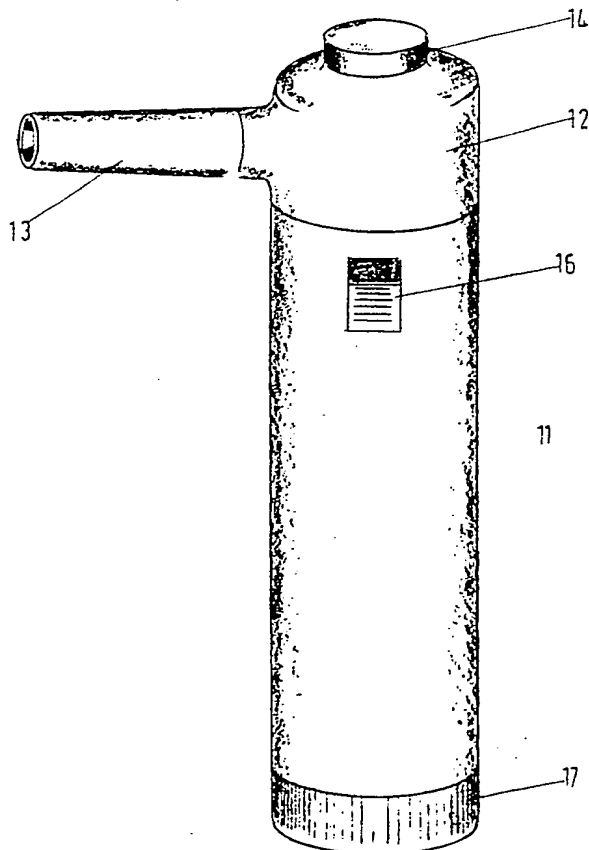
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INT CL<sup>5</sup> **A45D 20/00, A61C 17/022**  
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(54) **Hand-held, rechargeable battery powered dentist's warm air blower**

(57) This invention relates to a hand held warm air blower which can be used in dental surgeries or elsewhere to augment the now familiar compressed air operated dentists' blower apparatus. There is provided a dedicated, small, hand held air blower, which is battery powered and rechargeable and can be directed to eject a stream of warm dry air at any location in the mouth which is being worked on by the dentist. Working independent of the compressed air supply obviates the risk of oil or water contamination of the drying tooth surface.

This blower is significantly of value when carrying out dental fillings away from the fully equipped dental surgery, and particularly so when used at a farm or veterinary location.

Figure 1.



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Figure 1.

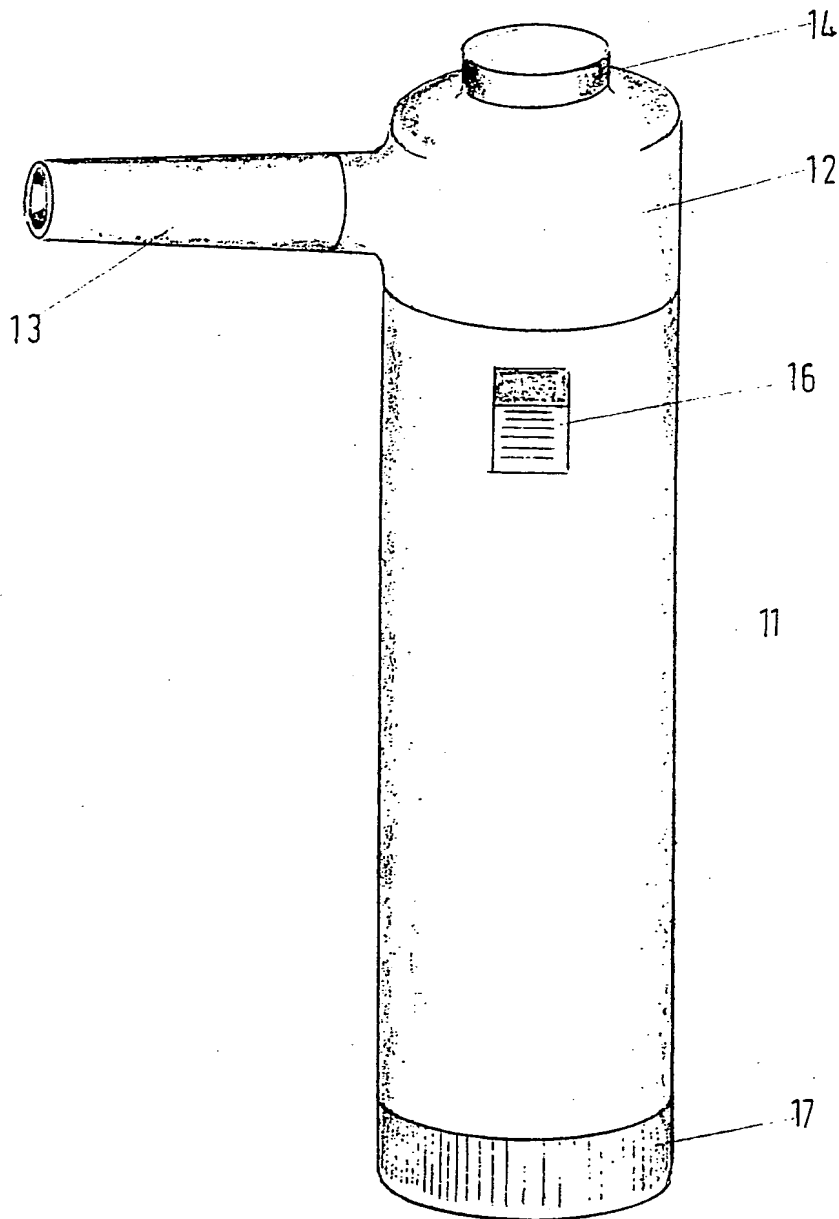
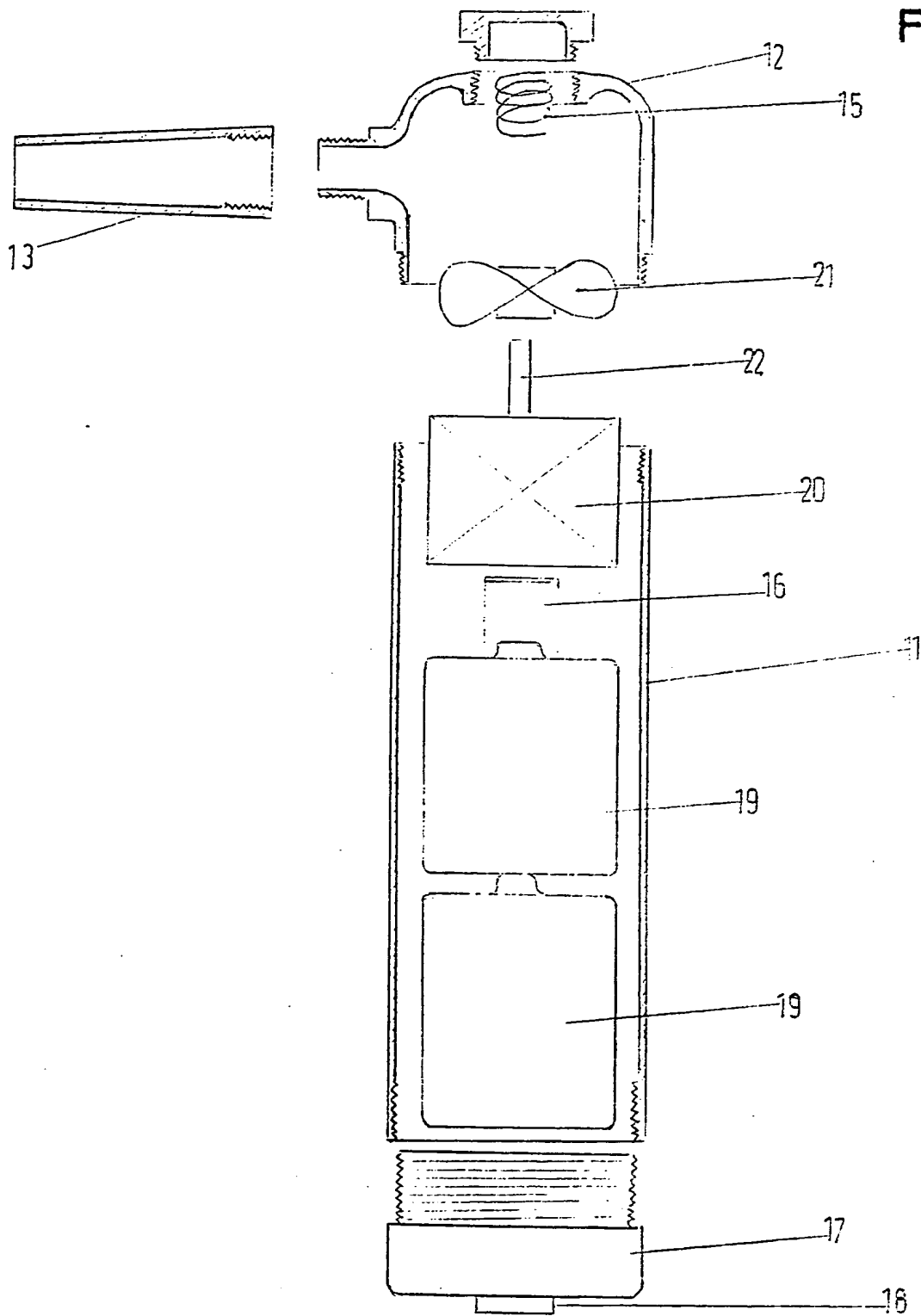


Figure 2



Sheet 1

HAND HELD, RE-CHARGEABLE BATTERY POWERED,  
DENTISTS' WARM AIR BLOWER

THIS INVENTION RELATES TO A HAND-HELD WARM AIR BLOWER WHICH CAN  
BE USED IN DENTAL SURGERIES OR ELSEWHERE TO AUGMENT THE NOW  
FAMILIAR COMPRESSED AIR OPERATED DENTISTS' BLOWER APPARATUS.

5 The first dentists' drill was described in 1725 by Pierre Fouchard  
in his book Le Chururgien Dentiste. This was a hand drill,  
specially designed for loosening decayed dental tissue and  
operated by twisting with with the fingers in alternate directions.

The first power operated dentists' drill was a clockwork implement,  
devised by George Fellows Harrington in June 1863 and later, 1875  
10 George F Green introduced a battery powered electrical dental  
drill.

Dentistry has gone a long way since then, under the influence of the  
College of Surgeons, and under the Medical Act 1858, which  
empowered the Royal College of Surgeons to institute dental  
15 examinations and award certificates of professional competency.  
Not until 1921 however, did <sup>the</sup> Dentists' Act raise dentistry from the  
level of a trade to that of a profession.

The present high competence of the dental profession is the result  
of a slow pattern of progress through the years, and today almost  
20 every dental practice is equipped with highly sophisticated apparatus  
which can drill at very high speed with very little vibration and  
less tendency to cause distress. The apparatus has an inbuilt  
source of compressed air to remove debris from the mouth during  
any drilling operation.

25 The apparatus is usually sited in whatever number of rooms  
form the dental surgery, and compressed air is delivered to  
each apparatus from a central air compressor, sited remote  
from the surgeries.

30 In modern dental techniques, the use of composite light cured  
materials and glass ionomers, require a clean moisture free  
surface for optimum bonding. The conventional compressed air  
delivered by the 'chip syringe' is frequently too humid, being  
dependent on weather conditions, air being drawn into the  
compressor, usually sited outside the surgery. The drawback  
35 with this 'two in one syringe' is that the air is delivered via  
the same tubing which has just been used for water in cleaning  
the tooth of etchant or debris. Sufficient air pressure is  
necessary to disperse the bonding agent over the etched surface.

40 According to the present invention, there is provided a small,  
hand held air blower, which is battery powered and can be  
directed to eject a stream of warm dry air at any location in,  
the mouth which is being worked on by the dentist. The air blower  
would fulfil the above criteria and can be operated by any  
assistant, since it is remote from the apparatus the dentist is  
45 or has been using.

The warm air dryer could also have applications in the area of animal  
dentistry.

A specific embodiment of the invention will now be described by  
way of example only, with reference to the accompanying drawings  
50 in which:-

Figure 1 illustrates the battery powered, warm air blower pictorially.

Figure 2 is an exploded view of the components comprising the said blower.

55 Referring to Figure 1 the battery powered, warm air blower 10 is a slim, cylindrically shaped, thumb operated appliance, which can be held in the hand easily and comfortably. Henceforth in this specification the battery powered, cylindrically shaped, thumb operated air blower 10 will be referred to as 'the  
60 blower 10'.

The blower 10 comprises of a hollow barrel 11, which contains a plurality of nickel cadmium rechargeable batteries which will provide direct current electrical energy to power a small rotary blower impeller encased in a rigid plastic volute 12.

65 The dry air is directed through nozzle 13 which projects in continuation of volute 12. Ambient air is drawn into the centre 14 of the volute through a nickel chrome heating coil, which imparts a modicum of warmth to the ambient air before it is impelled around the volute 12 and out through the nozzle 13. Initiation of the  
70 impeller is by a small electric motor (unseen in this fig.1) which is sited below the impeller within the rigid plastic volute 12. The starter for the motor 20 is a press-button 16, sited conveniently below the blower volute 12 on the barrel 11. By depressing the button 16 the electrical circuit is completed between motor 20  
75 and the power batteries 19.

The impeller will revolve at some 3,000 P.P.M. to provide an adequate jet of warm dry air at the nozzle outlet 13. This warm dry air can be conveniently directed at any focal point within the mouth by an appropriate assistant or by the dentist him/herself.

This blower 10 is significantly of value when carrying out dental fillings away from the fully equipped dental surgery, and particularly so when used at a farm or veterinary location.

Referring now to Figure 2 the blower is shown in an exploded manner to identify the components more effectively.

The battery barrel 11 is shown in two parts with the internally screw-rolled base 17 removed from the lower end of the barrel 11. The base 17 has a direct current charging jack socket securely to its cover. The D.C. jack socket 18 and batteries are hard-wired via the switch to the motor and heater. When the switch is depressed it completes the electrical circuit between batteries 19 and the motor 20, to set the motor rotor in motion and induce heat into the nickel-chrome coil 15. The motor is integral with the rigid plastic impeller volute 12 in its operating mode, but has been removed for the purpose of this Figure 2.

No function detail of the motor 20 is considered necessary in this specification, because originality is not claimed. Prior art exists for it, and due acknowledgment is hereby made for its adaptation in this embodiment.

The impeller volute 12 is shown in perspective and no further detail because it too is current commercial production.

Its use in this embodiment is similarly acknowledged.

The nickel-chrome wire coil 15, which receives direct current  
electrical energy of 15-20 watts supplied by 2 x 1.2 volt nickel  
105 cadmium "C" type batteries 19 is removed from the inlet 14 of the  
volute 12.

In production it is envisaged that the nickel chrome wire coil  
would be situated at the base of nozzle 13, ie, on the outlet  
of the impeller. The impeller 21 is a multi - vane unit which  
110 is fixedly attached to the rotor shafting 22 of the said motor 20.

Thus it can be seen that the blower 10 is uncomplicated in design  
and construction. It would be lightweight to handle, easy to  
hold and to operate in one hand. It will be most useful in the  
"field" where dentistry is being practised or it can be a useful  
115 substitute if a warm air pistol is not included with the modern  
dentist's surgery apparatus.



## CLAIMS

1. This invention relates to a hand held warm air blower which can be used in dental surgeries or elsewhere to augment the now familiar compressed air operated dentists' blower apparatus.
2. There is provided a dedicated, small, hand held air blower, which is battery powered and can be directed to eject a stream of warm dry air at any location in the mouth which is being worked on by the dentist.
3. Working independent from the compressed air supply obviates the risk of oil or water contamination of the drying tooth surface.
4. Particularly in the field of adhesive dentistry the provision of a dried tooth surface free from contaminants is of paramount importance.
5. The clean dry and warm air supply from this dedicated unit ensures a degree of control not present in currently available apparatus.
6. The blower is uncomplicated in design and construction.
7. It is lightweight to handle, easy to hold and to operate in one hand.
8. This blower is significantly of value when carrying out dental fillings away from the fully equipped dental surgery.
9. The blower will find a wider application in the farm or veterinary field.

Amendments to the claims  
have been filed as follows

1. A hand-held warm air blower which can be used in dental surgeries or elsewhere to eject a stream of warm dry air into the mouth.
  2. A warm air blower as claimed in claim 1 in which the power is provided by electric current.
  3. A warm air blower as claimed in claims 1 and 2 in which the power is provided by one or more batteries which may be rechargeable.
  4. A warm air blower as claimed in any of the preceding claims which is suitable for use in veterinary work.
  5. A warm air blower as claimed in any of the preceding claims in which there is used an impeller which suitably revolves at a speed of around 3000 R.P.M.
  6. A warm air blower as claimed in any of the preceding claims in which the ejected air is heated using a suitable heating element.
  7. A warm air blower as claimed in any of the preceding claims in which the air in the ejected air stream is heated preferably using a nickel chrome heating coil.
  8. Manufacture of a warm air blower as claimed in any of the preceding claims using an outer case, preferably of polymeric, readily cleansable or sterilizable material, means for input of the electric power, preferably a place for the location of batteries, a blower impeller heating element and a nozzle through which the air passes on to the tooth in the mouth, or other area of the animal to be dried.
  9. Use of a warm air blower as claimed in any of the preceding claims in dentistry.
  10. Use of a warm air blower as claimed in any of the preceding claims in veterinary work.
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## Relevant Technical fields

(i) UK Cl (Edition K ) A5R RCY RCL RDX; A4V V29D

(ii) Int Cl (Edition 5 ) A45D 20.00; A61C 17/022

## Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Search Examiner

MISS E M COLEMAN

Date of Search

24 FEBRUARY 1992

Documents considered relevant following a search in respect of claims

1-9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2170705 A (BISHOP)	1-9
E, X	EP 0462027 A1 (CABLECO) 18 December 1991	1-9
X	EP 0203437 A2 (BRAUN)	1-9
X	US 4939345 (FARINA)	1-9
X	US 4890395 (YAMAC)	1-9
X	US 4800654 (LEVIN)	1-9
X	GB 0372628 (FRANK)	1-9

SF2(p)

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Category	Identify document and relevant passages	Relevant to claim(s)

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X: Document indicating lack of novelty or of inventive step.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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